

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
28 April 2005 (28.04.2005)

PCT

(10) International Publication Number  
**WO 2005/039239 A2**

(51) International Patent Classification<sup>7</sup>: **H05B**

(21) International Application Number:  
PCT/US2004/034097

(22) International Filing Date: 18 October 2004 (18.10.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/481,520 17 October 2003 (17.10.2003) US

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(71) Applicant (*for all designated States except US*): **POWER CONTROL TECHNOLOGIES, INC.** [US/US]; 42 Butternut Court, Wilmington, DE 19810 (US).

(72) Inventor; and

(75) Inventor/Applicant (*for US only*): **IONESCU, Adrian, F.** [US/RO]; Alexandru Vaida Voevod Street 60, Apt. 19, R-3400 Cluj-Napoca (RO).

(74) Agent: **HUME, Larry, J.**; Connolly Bove Lodge & Hutz LLP, 1990 M Street N.W., Suite 800, Washington, DC 20036-3425 (US).

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM,

**Declarations under Rule 4.17:**

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations*

**Published:**

- *without international search report and to be republished upon receipt of that report*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: **BALLAST PROTECTING DEVICE**

(57) Abstract: A ballast protecting device is connected between an AC input voltage and a ballasted High Intensity Discharge lamp. The device includes a voltage sensing block, a current sensing block, a pulse forming block, a switch block and a micro-controller unit (MCU). The pulse forming block converts positive half cycles of the voltage and current provided by the voltage and current sensing blocks to square wave pulses, and the MCU performs a phase angle comparison between generated pulses. Upon lamp malfunction, ballast current is phase shifted. Current may also be phase shifted when there is a radical change in the input voltage. As a trend of the phase shift between current and voltage is determined by the MCU, a ballast disconnect decision is made, and the MCU actuates the switch block to disconnect the connected ballast and malfunctioning lamp.

WO 2005/039239 A2